

WHAT IS CLAIMED IS:

Claim 1. A system for locating and tracking at least one rover unit from a mobile controller unit comprising;

- a mobile controller unit comprising;
 - 5 a cellular telephone module;
 - a GPS receiver/processor module;
 - a specially programmed computer;
 - a display;
 - a power source;
- 10 a rover unit comprising;
 - a cellular telephone module;
 - a GPS receiver/processor module;
 - a specially programmed computer;
- 15 the mobile controller unit being programmed to have a find feature which includes selection of a command to establish a radio communication link with the rover and to obtain the rover's position information from the radio positioning module in a suitable coordinate system and the controller unit being further programmed to calculate upon command the relative spatial position having the controller as center and absolute positions of the controller and the rover on a map
- 20 whereupon the selected one of the relative spatial positions or the absolute map positions of the controller and the rover are available to be displayed on the display upon selection by the user.

Claim 2. The System of Claim 1 in which the controller unit and the rover unit use a commonly tracked suite of GPS satellites.

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- Claim 3.** The systems of claim 2 in which the controller unit is equipped with a compass to provide heading of the controller unit and to allow display of relative bearing to the rover

- 30 **Claim 4.** A system for locating on demand a rover unit relative to a mobile controller unit comprising;
 - a mobile controller unit having a radio positioning receiver; a radio communications module and a control system for sending instructions to a rover unit and for processing data received from a radio positioning module;

at least one rover unit having a radio positioning module, a radio communications module; a control system for receiving instructions from a controller unit and for sending data to a controller unit whereby the controller may display position data of the rover and may display relative spatial position of the
5 rover or absolute map position of the rover and the controller.

10 **Claim 5** The system of Claim 4 in which the radio positioning module is a GPS module.

15 **Claim 6.** The system of Claim 5 in which the controller unit is equipped with a compass to provide heading of the controller unit and to allow display of a relative bearing to the rover unit.

20 **Claim 7.** A system for locating and tracking at least one rover unit from a mobile controller unit comprising;

25 a mobile controller unit comprising;

 a radio communications module;

 a radio positioning module;

 a specially programmed computer;

 a display;

 a power source;

 a rover unit comprising;

 a radio communications module;

 a radio positioning module;

 a specially programmed computer

25 the mobile controller unit being programmed to have a find feature which includes selection of a command to establish a radio communication link with the rover and to obtain the rover's position information from the radio positioning
 30 module in a suitable coordinate system and the controller unit being further programmed to calculate upon command the relative spatial position having the controller as center and absolute positions of the controller and the rover on a map whereupon the selected one of the relative spatial positions or the absolute map positions of the controller and the rover are available to be displayed on the display
 35 upon selection by the user.

Claim 8 A system for locating on demand a rover unit relative to a mobile controller unit comprising;

a mobile controller unit having a radio positioning module and a radio communications module and a control system for sending instructions directly to a rover unit and for processing data received directly from a radio positioning module;

5 at least one rover unit having a radio positioning module, a radio communications module; a control system for receiving instructions from a controller unit and for sending data directly to a controller unit whereby the controller may display position data of the rover and may make available for display relative spatial position of the rover or absolute map position of the rover and the controller;

10 15 the radio communications module and control system of the mobile controller having direct communications with the control system of the same unit such that radio data sent by the rover unit is received directly by the mobile controller unit.

Claim 9 The system of Claim 8 in which the controller unit receives radio positioning data from a radio positioning system and the rover unit receives 20 radio positioning data from the same radio positioning system and the rover unit sends radio positioning data to the controller unit which compares the data to provide the relative spatial relationship of the rover unit and the controller unit.

Claim 10. The system of Claim 9 in which the radio positioning system is 25 the GPS or any other satellite radio positioning system.

Claim 11. The system of Claim 10 in which the controller unit and the rover unit use a commonly tracked suite of GPS or other system's satellites to provide relative spatial position.

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Claim 12. A method for locating a rover unit from a mobile controller unit in which the rover unit and the controller unit have cellular telephones capable of intra-communication of data and each have a radio positioning receiver capable of providing it's radio position information, and the rover has a means for sending

radio position information to the controller unit upon demand comprising; opening a cellular telephone link between the controller and the rover;

starting a procedure in which the rover's radio position information is sent to the controller;

5 comparing the rover's radio position information with the controller's radio position information to calculate relative spatial position quantities of the controller and the rover unit;

displaying the relative spatial position information on a display associated with the mobile controller unit.

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Claim 13. The method of claim 12 in which the radio positioning receivers are GPS receivers and the radio position information is GPS pseudorange and carrier phase information and the relative spatial position is determined using the information from commonly tracked satellites.

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Claim 14. The method of claim 12 in which the radio positioning receivers track a satellite radio positioning system.

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Claim 15. The method of claim 13 further comprising;
providing a compass direction to the controller unit and displaying a relative bearing of the rover unit to the controller unit.

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Claim 16. A method for locating a rover unit from a mobile controller unit in which the rover unit and the controller unit have radio communication capability between them such that the controller unit may upon query obtain information from the rover unit and each of the controller unit and the rover unit has a radio positioning module for obtaining radio positioning information such that radio position information of the rover unit will upon query be sent to the mobile controller unit and in which the mobile controller unit can process the radio position information to provide relative spatial relationship of the mobile control unit to the rover unit with periodic updates and displaying the relative spatial relationship on one or more displays associated with the mobile controller.

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Claim 17. A method for locating a rover unit from a mobile controller unit in which the rover unit and the controller unit have radio communication

capability between them such that the controller unit may upon query obtain information from the rover unit and each of the controller unit and the rover unit has a radio positioning module for obtaining radio positioning information such that radio position information of the rover unit will upon query be sent to the mobile controller unit and in which the mobile controller unit can process the radio position information to provide relative spatial relationship of the mobile control unit to the rover unit with periodic updates and displaying on one or more display associated with the mobile controller, as selected by the user;

an arrow showing the direction of the location of the
rover unit relative to the mobile controller unit;
a map showing the location of both the mobile
controlled unit and the rover unit;
identification data representing the rover unit.

15 **Claim 18.** The method of Claim 17 further displaying one or more of the following;

the speed of movement of the rover unit;
the distance of rover unit to the mobile controller unit;
the altitude of rover unit relative to the mobile controller
unit;
a map display showing the location of the rover unit and
trail indicia showing display a history of the location of rover unit over a specified
period of time;
geographical coordinates of the rover unit.

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Claim 19. The method of Claim 17 further comprising;
 providing a compass to the controller unit to enable
displaying of the relative bearing of the rover unit to the controller unit.

30 **Claim 20.** A method of finding a rover unit by use of a mobile controller unit comprising;

sending a query to the rover unit by signal from a radio communication module in the mobile controller unit to a radio communication module in the rover unit;

responding to the query, from the rover unit with radio positioning information obtained from a radio positioning module in the rover unit and sent to the mobile controller unit by way of the radio communication modules in each unit;

5 continuing to respond periodically with new radio positioning information;

comparing the radio position information sent to the mobile controller unit with radio positioning information received by the mobile controller unit by its own radio positioning module to determine relative spatial 10 position and absolute position of the rover unit;

displaying on one or more displays;

an arrow showing the direction of the location of the rover unit relative to the mobile controller unit;

the speed of movement of the rover unit relative to the 15 controller unit;

a map display showing the location of the rover unit and of the controller unit.

Claim 21. The method of Claim 20 further comprising;

20 providing by an optional selection;

on said map display showing the location of the rover unit also showing a series of indicia showing a history of the location of the rover unit.

25 **Claim 22.** The method of Claim 21 wherein the radio positioning modules are GPS modules and the rover unit and controller unit use information from commonly tracked satellites to provide relative spatial positions.